

Practical Seismic Upgrades



Presented by: David Alter P.E., S.E.



Earthquakes here?

- It's easy to “fall asleep” when we talk about earthquake hazards in Utah, right?



Loma Prieta, October 1989



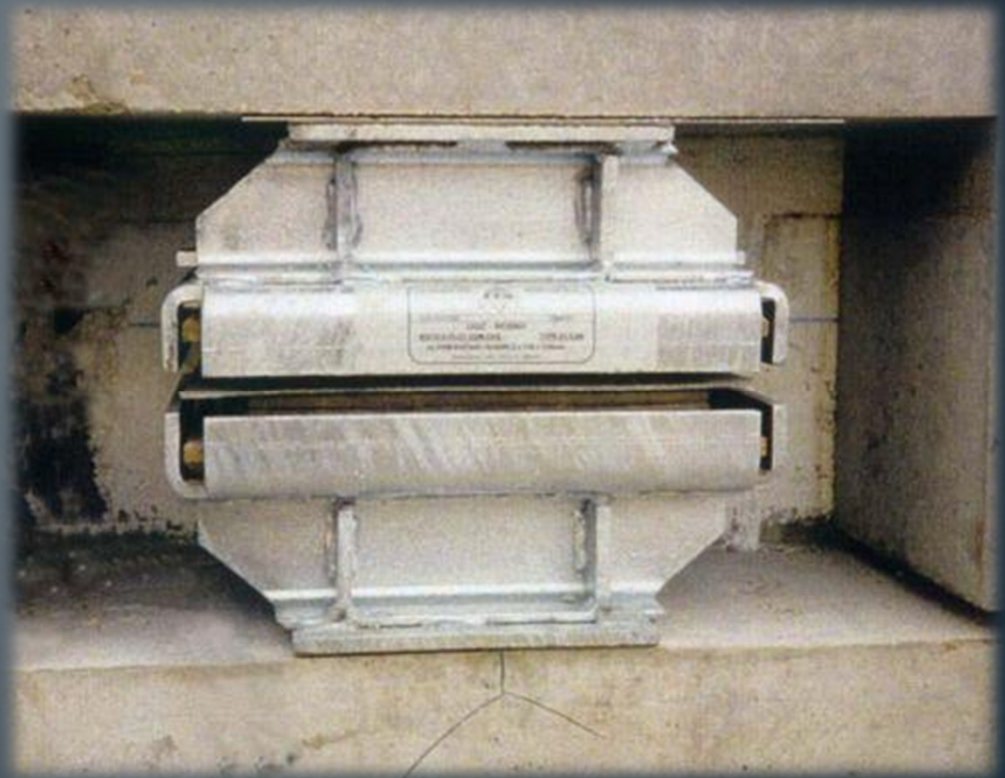
What is “Seismic Retrofit”?

- Strengthening existing buildings to resist anticipated seismic force levels



What is “Seismic Retrofit”? (cont)

- Or, provide greater “ductility”
- Base Isolation



What are “triggering mechanisms” for a Seismic Retrofit?

- Re-roof
- Look at connections from roof to walls
- Unbraced parapets



“Triggering Mechanisms” (cont)

- Remodels and additions
- Modifications to existing elements



What does the code say?

- Chapter 34, 2009 IBC:
 - Additions
 - Alterations
 - Voluntary Seismic Improvements
 - Repairs

What types of buildings are highest risk for earthquake damage?

- URM's (unreinforced masonry buildings)
- Soft Stories





Seismic Retrofit example – Brigham Young Winter Home, St. George, Utah



Brigham Young Winter Home (cont)



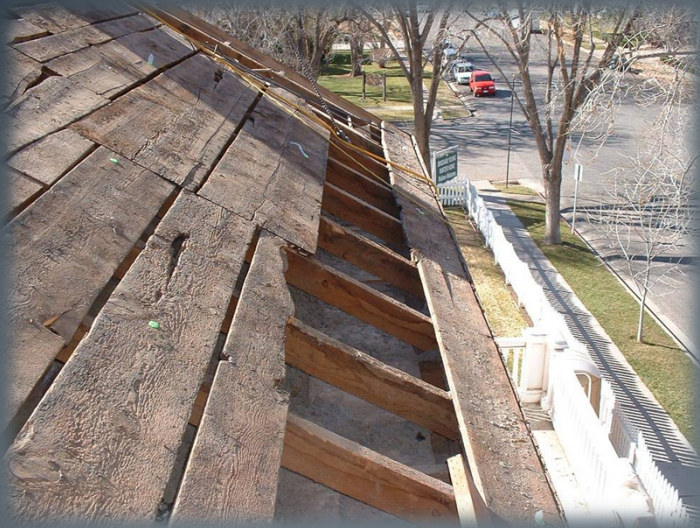
Brigham Young Winter Home (cont)



Brigham Young Winter Home (cont)



Brigham Young Winter Home (cont)



Brigham Young Winter Home (cont)



Brigham Young Winter Home (cont)



Conclusion



- Seismic Retrofits help preserve “old” buildings during seismic events
- Like new buildings, there is no “guarantee” of performance, but you have improved your odds of survival for occupants, and building damage will be reduced

Conclusion (cont)

- Seismic Retrofit may not be that expensive, if completed during re-roof or remodel work
- If building occupancy changes, building official may require a seismic upgrade in order to obtain an occupancy permit

Not doing anything could be the wrong choice!

